

Assessment Survey of Injection Safety and Safety of Phlebotomies,
Lancet Procedures, Intravenous Injections and Infusions in
Government Health Facilities in the Philippines

EXECUTIVE SUMMARY

Rationale: Safety of injections is an important health issue affecting millions of individuals worldwide. Injections are the most common health care procedure worldwide. It is estimated that as many as 16 thousand million injections are administered annually in developing and transitional countries alone. The assessment of the safety of injections was started by the World Health Organization (WHO) in 2000. Using a standardized survey tool, countrywide assessments on critical aspects of the injection procedure in over 90 nations became possible. With the findings using this standardized tool, an increase in awareness on the importance of safer injection procedures as well as comparisons between countries became possible.

Objectives: This study was done 1) to make an initial assessment survey of the injection safety practices in the government health facilities in the Philippines; and 2) to provide immediate feedback and recommendations for improvement on injection safety practices of the participating government health facilities. Specifically, the study was intended to a) to determine whether government health facilities wherein injection and related procedures are performed meet the necessary requirements for safe injection practices with adequate equipment, supplies and waste disposal mechanisms; b) to determine whether critical steps in performing procedures are executed according to recommended best practices; c) to identify the unsafe practices which may be improved; and d) to determine the

proportion of government health facilities observed to perform safe injection procedures.

Methodology: The assessment survey of eighty government health facilities using the WHO standardized tool C-revised was performed using a cross-sectional observational study design. Two-stage sampling was done to determine the 80 government health facilities needed to achieve a representative sample of government health facilities for accurate country assessment. The Injection Safety Study Team was formed and underwent training to standardize use of the pilot-tested WHO assessment tool C-revised. Data collection of the 80 health facilities was completed over a period of five weeks. Additional barangay health centers with close geographic proximity were also observed and paired with the 36 health facilities which did not routinely administer vaccinations and delegated immunization activities to their respective barangay centers. Information from the health facilities were obtained by structured observations of the facility, by observations of injections procedures, by interview of health providers and their supervisors and actual counting and observations of supplies.

Collected data was entered into the Epi Info data base and analyzed. Proportions and rates were computed as outlined in the Tool C-Revised protocol with the 95% confidence intervals also computed accordingly. All of the proportions and rates were tabulated according to standard tables previously developed by the WHO.

Results and Conclusions: A total of 80 facilities in seven (7) randomly selected regions in the Philippines were observed from November 15, 2007 to December 19, 2007. A total of 125 injections were observed in the 80 facilities. These

injections included: 60 vaccinations, 48 therapeutic injections, 2 family planning and 15 dental injections. Vaccination injections observed in this study included all the childhood immunization (DPT, MMR), pediatric and adult hepatitis immunization, and tetanus. Therapeutic injections included intramuscular antibiotic injections such as streptomycin, penicillin and intramuscular injections for immunoglobulin such as for tetanus. On the other related procedures, a total of 35 phlebotomies, 30 lancet procedures, 32 intravenous injections and 40 intravenous infusions were observed, Phlebotomy procedures were mostly observed at the facility laboratories. The intravenous injections and infusions were documented mainly in the emergency rooms and the ward areas. Overall, 262 procedures were observed using the structured WHO assessment tool- C revised.

The most important findings were: 1) the frequency of re-use of needles and evidence for attempts to sterilize used needles was low (less than 16%). This is also supported by the actual observations that injection devices were obtained by opening new sterile packets of new syringes and needles during the various procedures observed, seen in 80% or more of the procedures; 2) High frequency of noncompliance to best injection safety practices are widespread in the government facilities including hand hygiene before injection procedure, appropriate preparation the injection medication, vaccine or fluid in an adequately clean place, proper disinfection of skin site, use of gloves in procedures that invade the vascular system, palpation of the skin site after disinfection, and use of multidose vials with needles left neglected onto the diaphragms; 3) High frequency of high risk practices prone to needle stick injuries such as removing the uncapped needle from the adapter widely used in almost two-thirds of the

facilities, two handed recapping was observed in almost three-fourths of the facilities, and the transferring of blood from the syringe to a vacuum tube using two hands was seen in more than 80% of facilities; 4) Many facilities lacked adequate sharp disposal systems with only 49%, 45%, 69% and 66% of health facilities surveyed were documented to have at least one acceptable puncture-resistant container in designated areas where vaccinations, therapeutic injections, phlebotomies and intravenous procedures respectively were routinely performed for prompt and safe disposal immediately after each procedure. Only 17.5% (95% CI, 9.0, and 26.0) of the facilities had additional puncture resistant containers in stock when asked. In more than half of the facilities (56.2%) were overflowing or pierced sharps containers seen; 5) Incomplete protection for hepatitis B through vaccination of health care providers with only 61.2% admitting to having had received three or more doses of the Hepatitis B vaccine, and 77.5% at least one dose of the vaccine; 50% of health providers admitting to high frequency of needle stick injuries that not all needle stick injuries were reported with only 10 out of the 38 providers reporting; and only in about one-fourth of the facilities did the providers recall having attended an injection safety training lecture or workshop in the last two years; 6) Almost all facilities were unable to show a manual of injection safety or a manual of waste management.

The health provider staff of the participating health facilities expressed gratitude for being part of the study. Those who were able to attend the feedback workshops appreciated the information on injection safety and health waste management. By the end of the workshops, concrete plans to improve injection safety in their respective facilities have been identified.

Recommendations:

Based on the study findings, it is recommended that the Philippine national program for injection safety be strengthened with the strategies addressing the areas that were identified in this study as areas of concern:

- Training on infection control on safer injections including hand hygiene, single use devices, proper use of multi-dose vials, preparation of injection medication, use of gloves as needed and proper disposal of sharps and non sharps waste after injection procedure
- Increase awareness through training on risk reduction of needle stick injury by not recapping
- Availability of supplies of injection devices particularly recent advances in technology of syringes allowing auto-disable and other safety devices.
- Reducing retail cost of injection devices on a country level
- Availability of supplies for puncture-resistant disposal containers in all areas within all facilities performing injection procedures
- Increase coverage of protection of health providers by hepatitis B immunization
- Strengthening implementing rules and regulations on proper waste management and injection safety at local and national level to comply with international standards.

Assessment Survey of Injection Safety and Safety of Phlebotomies, Lancet Procedures, Intravenous Injections and Infusions in Government Health Facilities in the Philippines

I. INTRODUCTION:

Safety of injections is an important health issue affecting millions of individuals worldwide. It is estimated that as many as 16 thousand million injections are administered annually in developing and transitional countries alone.¹ On a daily basis, millions of people undergo some kind of injection procedure across the world. The most common reason for injection procedures is for a therapeutic purpose which comprise up to 90% of all injections. The rest of the injections (10%) are for preventive purposes such as immunization and family planning. Regardless of the purpose or situation in which injections are administered, whether these injections are for vaccination, therapeutic injections or phlebotomy for a diagnostic work-up, every injection must be a safe injection.

The principles of a safe injection are basic and universal. A safe injection, phlebotomy, lancet or intravenous insertion procedure must consist of the following: 1) it should not harm the recipient; 2) it should not expose the health provider to any avoidable risk; and 3) it should not result in waste that is dangerous to other people.² Through the years, more and more health facilities, professional organizations and governments of countries have become increasingly aware of the need for safe injection practices.

Unsafe injections can lead to morbidity and even to death. It may lead to avoidable risks to patients, to health care providers and to the community. Each year, hundreds of thousands of health care workers are estimated to be at risk for infections like Hepatitis B and C and the human immunodeficiency virus (HIV) due to unnecessary and avoidable accidents from needle stick injuries and mucosal exposures.³ Whether these injections are for vaccination, therapeutic injections or phlebotomy for diagnostic testing, patients must not be exposed to similar risks of unsafe injection and other needle stick practices. Similarly, the community where such injection procedures are performed should not be unduly exposed to any risks related to improper waste disposal practices of the needles and other sharp materials.

The assessment of the safety of injections was started by the World Health Organization in 2000. Using a standardized survey tool, countrywide assessments on critical aspects of the injection procedure in over 90 nations became possible. With the findings using this standardized tool, an increase in awareness on the importance of safer injection procedures as well as comparisons between countries became possible.

In the Philippines, the safety of injection practices as well as other related procedures like phlebotomy, use of lancet and intravenous infusions and injections has not yet been formally evaluated.

II. OBJECTIVES:

This study was done 1) to make an initial assessment survey of the injection safety practices in the government health facilities in the Philippines; and 2) to provide immediate feedback and recommendations for improvement on injection safety practices to the participating government health facilities.

Specifically, the study was intended a) to determine whether government health facilities wherein injection and related procedures are performed meet the necessary requirements for safe injection practices with adequate equipment, supplies and waste disposal mechanisms; b) to determine whether critical steps in performing procedures are executed according to recommended best practices; c) to identify the unsafe practices which may be improved; and d) to determine the proportion of government health facilities observed to perform safe injection procedures.

III. METHODOLOGY

1. Study Design:

The assessment survey using the WHO tool C-revised was performed using a cross-sectional observational study design.

2. Description of Country

The Philippines is an archipelago comprise by over 7,100 islands. Geographically, there are three main island groups: Luzon, Visayas and Mindanao. Administratively, the country is divided into 17 regions from Region I to Region

XIII and the National Capital Region (NCR), the Autonomous Region of Muslim Mindanao (ARMM) and the Cordillera Administrative Region (CAR). Each region is further comprised by several provinces; each province by several municipalities and cities. Each municipality is comprised of several barangays. The population of the Philippines in 2007 was reported to be 87.6 million people.

The state of health in the Philippines has greatly improved over the past 20 years. This was attributed mainly through mass immunization plans, health education, vector control, and the provision of potable water. The government of the Philippines allocates 3% of its budget for the health sector or an expenditure that would allow US\$4.10 for each Filipino each year.⁴

Important health indicators of the country include the following: Infant mortality rates (IMR) declined to 29 per 1000 live births in 2003, from 32 per 1000 live births in 1998, and down from 52/1000 in 1980.⁵ Maternal mortality ratio (MMR) likewise improved from 209 per 100,000 live births in 1993 down to 172 per 100,000 live births in 1997.⁵ The leading cause of mortality is heart disease, causing 79 deaths/100,000 people in 2000. The most common 10 leading causes of morbidity are still the communicable diseases and from 1995 to 2000 included diarrhea, bronchitis, pneumonia, influenza, tuberculosis, malaria, chickenpox and measles. In 2001, an estimated 0.07% of the population was living with HIV/AIDS. Measles and DPT immunization rates have improved in past five years, yet they are still lower than rates in 1980. As of 2001, 79% of the population was immunized against DPT, and 71% against measles. In 2000,

65.3% of total births were attended by trained personnel⁵ and an estimated 86% of pregnant women receive ante-natal care.

3. Government Health Facilities Included

Government-run or public health facilities in the Philippines are of several types. The Department of Health (DOH) through the Regional Health Offices [i.e. Centers of Health Development (CHD)] provided the study team with the master list of all the licensed government health facilities in the country indicating their level of care offered, service capability and authorized number of beds. In this list there are 703 listed facilities: with 331 Level 1 facilities or infirmary level; 282 Level 2 or primary care level; 36 Level 3 or secondary care level; and Level 4 or tertiary care level facilities. Administratively, these facilities could be either a national facility (i.e. by the Department of Health or the Department of Defense) or run by the local government (either at the provincial, city or municipal level).

This assessment survey included 80 representatives of government health facilities from regions across the country randomly taken from this master list of licensed facilities obtained from the DOH.

In addition to the licensed facilities listed in the above master list of the Department of Health, several hundred small barangay health centers exist throughout the country. Administratively these smallest health centers are run mainly by the municipal government units. Many of the programs of the Department of Health are trickled down to these centers for implementation. For instance, the expanded immunization program of the DOH is fully implemented

through their involvement, making vaccines available and accessible to the smallest barangays. For these health centers, licensing and quality assurance procedures are accomplished through agencies such as the Philippine Health Insurance Corporation (PHIC) and the Sentrong Sigla certification... A master list of all these barangay health centers is not readily available but may be obtained mainly by putting together reports of all the listings of municipalities across the country.

In this study, when the randomly selected health facility does not routinely perform vaccination at their facility sites and instead delegates the responsibility of immunization of the community to their partner barangay centers, the closest barangay health center were identified and were included as observation sites for vaccination procedures.

A letter of introduction was prepared by the Department of Health inviting the government health facilities to participate in the study. The final consent to visit the facility was given by the highest official of the facility, usually the medical director. Proper introduction, courtesy calls and expression of gratitude were observed before and after the assessment survey was made.

4. Description of the Assessment Survey Tool:

The Tool-C-Revised of the World Health Organization was used in a standardized manner across all the 80 government health facilities surveyed. This assessment tool has been developed by the WHO and has been successfully used in over 90 countries. The initial version of this tool looked mainly into vaccination and

therapeutic injections. The revised version now includes other related procedures such as phlebotomy, lancet procedures, intravenous injections and infusions.

The Tool-C Revised has been pilot-tested previously in the Philippines and suggestions on how the tool could be modified to adjust to the needs of the local implementing team of assessors have been submitted (Appendix A).

The Tool-C Revised underwent minor revisions before its actual final form to be used in the survey. The final format used for this study in the Philippines is seen in Appendix B.

The assessment survey tool has seven major portions as shown in Table I.

Table I: Contents of the Tool-C Revised survey assessment tool used for the study

Section Number	Specific Areas/Procedures/Persons Observed or Interviewed
Section 1	Facility observations
Section 2	Structured observations of injection practices <ul style="list-style-type: none"> • Vaccinations • Therapeutic injections • Family Planning injections • Dental injections
Section 3	Structured observations of other procedures <ul style="list-style-type: none"> • Phlebotomy • Lancet procedures • Intravenous injections • Intravenous infusions
Section 4	Structured observations of sterilization practices of injection equipment
Section 5	Interview of the health provider doing the injection procedure
Section 6	Interview of the immediate supervisor of the health provider
Section 7	Structured observations of the disposable injection equipment

5. Types of Providers and Services Included:

Within the identified government health facilities, the areas providing the following services will be included in the survey to assess injection practices within the area: Outpatient Dental Clinic, Outpatient Minor Surgical Clinic, Immunization Clinic, Emergency Room, Laboratory, Blood Bank,

As described above, when the health facility delegated its immunization functions to the barangay health centers, these procedures were observed at the nearest available health centers.

Doctors, nurses and midwives and their immediate supervisors providing direct patient care in these areas were invited to participate in the survey for interview.

6. Procedures for Sampling:

Two-stage sampling was done to determine the 80 government facilities needed to achieve accurate data from a representative sample of government health facilities. In this sampling method, the sampling unit is the health facility.

Strictly following the steps on the sampling procedures provided by the WHO Tool-C Revised protocol, the first stage was determined by cluster sampling to select the regions in the Philippines to be included in the study. Figure 1 highlights in a country map the seven regions in the Philippines which were randomly selected from the thirteen regions to be the sites of the study. Table II summarizes seven regions and the corresponding number of government health facilities per region. In the sampling method used, the probability of selection was

proportional to the population size. This self-weighting process explains why the National Capital Region was allowed to have 20 representative health facilities as its population was equivalent to two regions.

Table II. Regions selected in the Injection Safety Study, Philippines 2007

Regions included in Assessment Survey	Number of Health Facilities
Region I – Ilocos Region	10
Region III – Central Luzon	10
Region IVA - Southern Tagalog	10
Region VI - Western Visayas	10
Region VIII – Eastern Visayas	10
Region XI - Southern Mindanao	10
National Capital Region	20
TOTAL	80

The second stage of sampling randomly selected the individual government health facilities within the chosen regions to comprise the ten randomly selected study sites per region. The final list of facilities included in this survey is seen at Appendix C. From each region, ten facilities were selected of which one tertiary hospital was included and the rest of the nine other government facilities were either primary, first or second level hospitals.

As mentioned above, barangay health centers or rural/city health units were included and paired with the initial 80 participating health facilities when vaccination was not performed in the originally chosen facility and instead delegated to the partner health center.



Figure 1. Country map of the Philippines highlighting the selected regions.

7. Data Collection:

The schedule followed by the project team can be found in Table III. The actual period for data collection took longer than originally planned by almost three weeks because of the following major reasons: 1) The approval process of the health facility officials for the team to visit their respective facilities took longer than anticipated for some of the areas specially in the urban areas; 2) Bad weather conditions which included two strong typhoons that the country, particularly Regions VI and VIII, experienced during the study period; The period of study unfortunately coincided with extremely unexpected weather disturbance not very typical for that time of the year. 3) Many facilities which were randomized to be included in the study in most of the regions were in geographically separate and very distant locations from one another. These entailed long travel times involving land, air and sea travel between facilities and thus did not allow at least two facilities to be visited on the same day as was originally planned; 4) The modified schedule also accommodated the additional 35 barangay health units that data collectors had to return to so that more vaccination procedures could be included in the survey. The barangay health centers, in general, perform immunization activities on Wednesdays

Training of Data Collectors:

The training and orientation workshop of the Injection Safety Team composed of 16 assessors, 5 field supervisors and 1 encoder was held on November 13-14, 2007. The names, educational background and work experience of the Injection Safety Study Team can be found in Appendix D.



Figure 2. Injection Safety Study Team during training workshop, November 13, 2007, Manila, Philippines.

In this training workshop, the team was oriented to the nature and importance of the project, was given an overview lecture on injection safety with definition of terms, best practices, and related infection control principles. The workshop included small group demonstration of injection procedures emphasizing the right and wrong practices each field assessor may encounter during data collection. A special segment of the workshop went through the assessment tool in detail. Each question in the survey was discussed extensively. The participants were given a preview on the various possible observations they may anticipate in the field and instructed the proper ways these should be documented in the assessment survey tool.

To further prepare the assessors on data collection as well as to collect actual hospital data, the University of the Philippines - Philippine General Hospital (UP-

PGH) was purposively chosen to be the site for initial facility assessment survey and this was done on November 14, 2007. This activity was done to give the assessors actual experience in making observations in actual injection procedures and documenting these observations by using the assessment tool correctly. The data collected for this facility was however not included in the nationwide survey. Instead the collected information was encoded separately and analyzed accordingly.

After spending the morning of November 14, 2007 in various sites of the UP-PGH, the 16 assessors regrouped and discussed experiences, questions and other relevant issues.

Data collection at the National Capital Region commenced on November 15, 2007. Subsequent data collection of all other regions started on November 19, 2007. All data collection was completed on December 19, 2007. Figure 3 below shows the part of the study team in a rural health unit in Region IV with WHO consultant Dr. Selma Khamassi.



Figure 3. Injection Safety Study Team in a Rural Health Facility, November 2007, Philippines.

Table III: Time Line of PHICS-DOH-WHO Injection Safety Study, Philippines 2007.

Week 1 (Nov 5-9)	Week 2 (Nov 12-16)	Week 3 (Nov 19-23)	Week 4 (Nov 26-30)	Weeks 5-7 (Dec 3-21)	Week 8
Preparation	November 13: Training of Assessors	Start of Data Collection for Regions III, IV, VI, XI	Nov 26: Start Data collection at Region VII (Facilities 71-78)	Dec 5, 12, and 19 Wednesdays Return to Rural health units for Regions I, III, IV, VI, XI,	Analysis and Writing of Interim Report
Finalization of Protocol/Tool	November 14: Test Run of Data Collection: Philippine General Hospital	Continue data collection at NCR		Dec 3-7: Region VIII	
Communications with facilities	November 15: Start of Data Collection				
Recruitment of Assessors	Start of data collection at NCR				
Procurement of Materials	Simultaneous checking of data entry for completeness	Simultaneous checking of data entry for completeness	Simultaneous checking of data entry for completeness	Simultaneous checking of data entry for completeness	
Arrangements for Travel	Simultaneous encoding of data	Simultaneous encoding of data	Simultaneous encoding of data	Simultaneous encoding of data	

8. Data Management:

The following important aspect of data management needs to be emphasized. Despite numerous observation areas within each facility, multiple observations of various procedures and several interviewed providers, each facility was only represented by one response for each item in the data collection forms. This entailed a process in which two or more of the data collectors would sit together and summarize the various observations and responses to interviews such that only one answer represents the facility of that particular question. The chosen answer would be the “worst” practice or “worst” response having as reference standard what was considered “best practices in injection safety” as taught during the training of data collectors.

This aspect of data management is a very critical step in data management and analysis of this study. The consequences in the summary performance of each facility need to be understood not only by the readers of the results of this study but by the officials and other staff of the participating facilities as well. For instance, one facility may have several sinks for hand washing in most areas where injection procedures were performed. However during the visit, the phlebotomy area was noted not to have a sink for hand washing. In the summary data collection form, the single entry for the facility will record “NO” as the response to the query of having sinks for hand washing even if there may be ten other sinks in that facility. Similarly, if there were two observations made on intravenous insertion and infusion. One provider wore gloves and the other did not wear gloves during the procedure, the recorded response into the summary form will be the “worse“ observation. There were only a maximum of eighty (80) responses for each assessment tool item, each health facility represented only once per item.

Data collection forms were checked rigorously by field supervisors for completeness before leaving regions and study sites.

Data were encoded and entered into the Epi Info database. The accuracy of data entry into the Epi Info program was cross checked by comparing the frequency of responses tabulated by the Epi Info against a manual tabulation of data. This checking step was repeated with five randomly selected items. No errors were detected and data entry was assumed to have been performed with adequate accuracy.

Proportions and rates were computed as outlined in the Tool C-Revised protocol. Percentage and standard errors are reported in three (3) decimal places. The 95% confidence intervals were computed accordingly. Some 95% confidence interval estimates of percentages contain implausible values (i.e. <0 and >100 ; these are noted. Some items do not have interval estimates because of small sample size.

All of the proportions and rates were tabulated according to standard tables previously developed by the WHO and reported below.

9. Improvement Workshops:

Three training workshops on injection safety were held on November 29, 2007 for the first 10 facilities of the National Capital Region, March 25, 2008 for the other government participating facilities; and on March 26, 2008 for the Philippine General Hospital.

Each workshop was an eight-hour (8am-5pm) activity and involved key hospital officials who played important roles in the procurement of supplies and implementation of policy related to injection safety. These may include: Hospital Director, Chief of Health Operations, Chief of Nursing, nursing supervisors, infection control officers, laboratory managers, purchasing officer and pharmacy as well as training officers.

Content and final format of workshop was developed according to the results of the assessment survey. In general, all workshops followed a template as seen in Table IV.

In general, the responses of the representatives of the health facilities were very positive. They expressed gratitude in having been part of the study and for the initiative of being told of the results of the study. The workshop participants found the lectures very informative. Break-out sessions allowed them to work out the problems in their respective sites and identify feasible solutions which could be immediately be implemented to improve injection safety in their institutions. Figures 4, 5 and 6 documents the participants in the various workshops held.



Figure 4. Participants in the Injection Safety Workshop I for the National Capital Region. In the photo is WHO consultant Dr. Selma Khamassi holding the plaque of appreciation. November 26, 2007 Manila, Philippines.

Table IV. Template of Feedback and Training Workshop on Injection Safety:

Time	Content	Persons Needed	Resources Needed
8Am	Registration	Secretariat	Registration materials Camera
8:30-9:30	Orientation to Workshop: Rationale, Objectives and Strategies Introduction of Participants and Faculty	Facilitator	
9:30-10:30	Lecture 1: Injection Safety; International Standards of Care, Common Problems	Lecturer	Laptop, LCD Demonstration Materials
10:30-12	Workshop 1: Breakout into groups: Results of Assessment Survey Identification of Problems/Unsafe Practices	Facilitators – one per group	Writing boards and pens
12-1	Lunch		Lunch
1-2	Lecture 2: Best Practices in Injection Safety	Lecturer	Laptop LCD
2-3	Lecture 3: Sharps and Waste Management	Lecturer	Laptop LCD
3-4	Workshop 2: Identifying Solutions to Improve Injection Safety in individual areas/facilities	Facilitators	Writing Boards and pens
4-430	Reporting of Output: Plans for Improvement	Reporter per group Recorder for documentation	Camera Tape recorders
4:30-5:00	Closing Ceremonies Certificates and Tokens of Appreciation for Participation	Facilitator	Certificates Token gifts for individuals and for institution



Figure 5. Participants in the Injection Safety Workshop II for the National Capital Region. March 25, 2008 Manila, Philippines.



Figure 6. Participants in the Injection Safety Workshop for the Philippine General Hospital, March 26, 2008 Manila, Philippines.

The Philippine General Hospital, being a training university hospital, was not included in the final analysis of the data. Its participation was being the site for the training of the field assessors. The information gathered during such activity was however important and was used for the improvement of the hospital practices on injection safety.

10. Feedback Reports

Each health facility which participated in the workshops was given a confidential report summarizing the findings in their respective institutions and compared to the

accepted “best practices” in injection safety. The compilation of these individual facility summary reports is found in a separate document. A sample of this individual facility report is seen in Appendix D.

IV. RESULTS:

A total of 80 facilities in seven (7) randomly selected regions in the Philippines were observed from November 15, 2007 to December 19, 2007. Table V shows the distribution of the facilities according to region.

Table V: Distribution of facilities according to region

Location	Frequency	Percent
NCR	20	25.0%
REGION I	10	12.5%
REGION III	10	12.5%
REGION IV	10	12.5%
REGION VI	10	12.5%
REGION VIII	10	12.5%
REGION XI	10	12.5%
Total	80	100.0%

Great care was observed in completing data collection from all the 80 government health facilities in the original base random sample without replacement. However, from the original list of 80 facilities, eighteen were replaced by the alternate facilities because of any one of the following reasons: 1) the health facility had recently privatized and thus not run by government anymore; 2) the head of the facility was not available on the requested date of the visit by the study team; 3) the facility was in a high risk area such as where there were reported guerilla war groups or in an island during the typhoon, thus posed potential security risks to the assessors; or 4) the facility could not be physically accessed such as in a remote mountainous area and

transportation was difficult. The alternate facilities were chosen also by random sampling.

1. Inclusion of Rural Health Units:

During the course of data collection, it was observed that the number of injection procedures for immunization actually performed in the participating government health facilities was limited. Regardless of the level of health facilities, whether Level 1, 2, 3 or 4, many institutions apparently delegated most of its vaccination activities to local centers called rural health units or the city health units. Thus, as described in the methodology, when a health facility did not have a vaccination procedure on the day the visit was made, the nearest rural or city health unit was identified as well as the next available scheduled immunization day. These paired RHUs were visited and observed for injection practices for vaccination. The data on observations for vaccination was incorporated into the data of its partner health facility in the original list of 80 government facilities.

Table VI tabulates the pairing of the RHUs with licensed government health facility. A total of 35 rural or city health offices were included. Despite efforts to go back to the RHUs particularly in the Visayas and some areas of Luzon, vaccination practices were still not documented for Region VI, VIII and some parts of Luzon because of the destruction of rural health units during the recent typhoons. For some areas, the RHUs performed vaccination in situations or schedules that could not be accommodated in the time frame and the scope of this study. For instance, some RHUs gave vaccination to its community by doing home visits and may involve hours of walking to remote villages. Others developed a once a month schedule such as anti-measles campaign.

Table VI. Pairing of RHUs and Govt Health Facility

Regions	No. of govt facilities paired to a Rural or City Health Unit
I	6
III	5
IVA	6
VI	6
VIII	0
XI	5
NCR	7
TOTAL	35

2. Specific Areas Observed within each Facility

Each health facility was thoroughly inspected in as many areas as injections and the related procedures could be observed at the time of the visit. Table VII below lists the areas within the health facilities visited which were closely observed. The most frequently visited areas in the facilities visited where injection and related procedures were documented to have been performed were the Emergency Room (82.5%) and the Laboratory (77.5%). The various outpatient clinics were also valuable sources of information as the combined frequency of all the clinics where procedures were observed was 59 or 73.75%

Table VII: Specific Areas observed in the 80 facilities

Facility Area	Frequency	Percent (N=80)
Emergency Room	66	82.5%
Laboratory	62	77.5%
Nearest Rural or City Health Unit	35	43.7%
Dental Clinic	19	23.8%
Well Baby Clinic	13	16.3%
Medical Outpatient Clinic	12	15.0%
Ward	8	10.0%
Family Planning Clinic	7	8.8%
Blood Bank	6	7.5%
Maternity Clinic	5	6.3%
Surgery Clinic	1	1.3%
TB Clinic	1	1.3%
Anti-rabies Clinic	1	1.3%

3. Specific Injection Procedures Observed in the Facilities

The project team exhausted all efforts to document as many types of injections and other related procedure as were present in each of the health facilities during the visit. While multiple procedures of the same type may have been observed during the same visit, for instance 2 intravenous insertions, only one was entered into the data collection forms and condensed observations such as the “worst” practice was the one noted.

A total of 125 injections were observed in the 80 facilities. These injections included: 60 vaccinations, 48 therapeutic injections, 2 family planning and 15 dental injections. Vaccination injections observed in this study included all the childhood immunization (DPT, MMR), pediatric and adult hepatitis immunization, and tetanus. Therapeutic injections included intramuscular antibiotic injections such as streptomycin, penicillin and intramuscular injections for immunoglobulin such as for tetanus.

On the other related procedures, a total of 35 phlebotomies, 30 lancet procedures, 32 intravenous injections and 40 intravenous infusions were observed, Phlebotomy procedures were mostly observed at the designated collection areas in the facility laboratories. The intravenous injections and infusions were documented mainly in the emergency rooms and the ward areas.

The table below summarizes the list of the different injection-related procedures observed in this study:

Table VIII. Distribution of injection and injection related procedures observed.

Procedure	Number
Injection	125
Vaccination	60
Therapeutic injection	48
Dental injections	15
Family planning	2
Phlebotomy	35
Lancet procedure	30
Intravenous injection	32
Intravenous infusion	40
TOTAL PROCEDURES OBSERVED	262

4. Indicators:

From the data collected from various observations and interviews of the 80 health facilities, indicators reflecting risks of unsafe injection practices can be categorized into three groups: 1) indicators reflecting risks to patients; 2) indicators reflecting risks to the health provider; and 3) indicators reflecting risks to the community.

Each indicator for a certain risk posed to the patient, the health provider or the community is based on at least one item in the assessment survey. Some very important indicators are based on multiple items and collected by both interview and observation.

These indicators have been calculated based on the responses during the assessment survey and summarized in Tables VIII to XXI found in the subsequent paragraphs.

A. Indicators reflecting risks to patients

The greatest risk of unsafe injections may occur to the customer: the patients. Because of certain unclean and unsafe practices, injections which should be sterile may not be

sterile. Instead, these may actually carry harmful material which can cause infection or disease.

Injections where the materials were not properly prepared, the needle re-used, or the provider did not perform proper hand hygiene, may cause injection problems such as infection at the injection site, transmission of blood borne pathogens such as hepatitis B, hepatitis C, HIV and bacteria, and other adverse reactions due to infusion or injection of impurities.

A main aspect of safe injection is the assurance that each procedure is performed using a new sterile single use device with the right medicine, vaccine or fluid for infusion. The old unhealthy practice of reuse or recycling of needles is thus a concern of many health systems especially in countries of limited resources.

This Philippine study shows that the frequency of recycling or reuse of needles for injection is low. Based on observations made by the trained assessors, only 6.329% or 5 of 79 facilities were noted to have some evidence of attempt to sterilize previously used needles as shown in Table IX, Item 1104. This low proportion of reuse or recycling is also reflected in observations of actual procedures wherein the use of reusable syringes were mostly limited to the dental procedures (Table X, Item I205). Structured observations of actual vaccinations showed that 57 of these (or 90%) obtained the needles and syringes from sterile packets or fitted caps. The same high proportion of usage of syringes and needles from sterile packets were seen in 43 of 48 therapeutic injections (or 89.6%), 2 out of 2 family planning injections, and 13 of 14 dental injections (or 92.8%) (Table X, Item I206).

Sterilization of used needles and sterilizable syringes were infrequently encountered among the facilities visited (Table XII) with steam sterilization seen in 5.1% (95%CI - 2.9, 13.0) of facilities and boiling observed in 16.2% (95%CI 1.51, 30.99). These were used mostly for dental injection devices.

On actual observations of other procedures documented in Table XI, item I311, 34 of the 35 phlebotomies (or 97.1%), used new needles and syringes which came from sterile packets or fitted caps, and 38 of 40 intravenous infusions (or 95%). On the other hand, only 26 of 30 lancet procedures (or 86.7%) made use of new sterile lancets. And surprisingly, only 21 of 32 intravenous injections (or 65.7%) made use of syringes and needles from new sterile packets.

When health providers each from their respective institutions were asked, their responses to the questions related to reuse of needles for injections, phlebotomies and intravenous infusions affirm the observations made as seen in Table XIII. The interviewed providers claim to exclusively using single use sterile needle and syringe for injections (83.7%), for phlebotomies (80%) and for intravenous infusions (80%). Overall the re-use of needles was low, with over 80% of procedures noted to use new sterile syringes and needles, lancets and other devices taken from sterile packets or fitted caps.

What may be more concerning is the continued use of multi-dose vials with needles left in diaphragms of the vials and reused to aspirate the next dose of medicine for the next injection. These were mostly seen in the emergency rooms and noted for medicines such as anesthesia or heparin. In this study, more than two-thirds of the

government hospitals were observed to have the presence of multi-dose vials left aside with needles.

Table IX. Structured Observations of the Facilities that may reflect risks to patients

Item No	Description	#	N	%	Standard Error (SE)	95% CI	
						Lower Limit	Upper Limit
I101	Percentage of facilities with NO loose disposable injection equipment outside of packaging anywhere inside the facility	36	80	45.000	9.007	22.962	67.038
I102	Percentage of facilities with NO loose phlebotomy equipment outside of packaging anywhere inside the facility	59	75	78.670	8.218	58.558	98.776
I103	Percentage of facilities with NO loose IV equipment outside of packaging anywhere inside the facility	62	77	80.519	6.541	64.514	96.525
I104	Percentage of facilities with [YES answer] evidence of attempted sterilization of disposable injection equipment	5	79	6.329	4.452	-4.563	17.222
I106	Percentage of facilities with NO non-sharps infectious health care waste of any type outside of containers specific for non-sharps infectious waste	11	80	13.75	4.803	1.997	25.503
I107	Percentage of facilities with NO multi-dose vials with needles left in the diaphragm	25	78	32.051	3.590	23.266	40.837
I116	Percentage of facilities with running water and soap for cleansing hands [YES answer]	56	80	70.0	5.401	56.785	83.215
I117	Percentage of facilities with alcohol-based hand rub for cleansing hands [YES answer]	32	80	40.0	6.614	23.815	56.185

Ensuring safety of injections by providing the necessary facilities to make possible appropriate injection preparation has always been found to be useful. For instance, hand washing facilities with running water and soap so that hands can be cleaned is a necessary equipment for all areas where injections are administered. For government facilities, such sinks with water and soap were only available in 56 of the 80 government health facilities (or 70.0%) and alcohol-based hand rub in even fewer hospitals, 32 in 80 (or 40.0%).

Table X. Structured observations of injection practices that may reflect risk to patients

Item No	Description	#	N	%	SE	95% CI	
						Lower Limit	Upper Limit
I201	<i>Percentage of facilities in which injections are prepared on a clean, dedicated table or tray where contamination of the equipment with blood, body fluids or dirty swabs is unlikely [YES answer]</i>						
	Vaccinations	39	60	65.000	5.739	50.958	79.042
	Therapeutic	25	48	52.083	4.762	40.431	63.736
	Family Planning	0	2				
	Dental	14	15	93.333	7.569	74.814	111.853
I205	<i>Percentage of facilities in which a sterilizable syringe or needle was used for an observed procedure [YES answer]</i>						
	Vaccinations	1	60	1.667	1.713	-2.524	5.857
	Therapeutic	0	48	0			
	Family Planning	0	2				
	Dental	4	15	26.667	11.780	-2.158	55.491
I206	<i>Percentage of facilities in which for injections, syringes and needles were taken from a sterile packet or fitted with caps [YES answer]</i>						
	Vaccinations	57	60	95.000	2.394	89.141	100.859
	Therapeutic	43	48	89.583	3.703	80.523	98.643
	Family Planning	2	2				
	Dental	13	14	92.857	8.147	72.921	112.793
I208	<i>Percentage of facilities in which for reconstitutions, a syringe and needle was taken from a sealed packet or fitted caps [YES answer]</i>						
	Vaccinations	25	29	86.207	8.359	65.754	106.660
	Therapeutic	18	23	78.261	10.812	51.805	104.716
	Dental	0	1				
I209	<i>Percentage of facilities in which for vaccine reconstitutions, the diluent used is from the same manufacturer that made the vaccine [YES answer]</i>						
	Vaccinations	21	25	84.000	12.500	53.414	114.586
I210	<i>Percentage of facilities in which providers cleansed the access diaphragm of multi-dose vials with antiseptic before inserting a needle into the vial [YES answer]</i>						
	Vaccinations	9	43	20.930	10.105	-3.796	45.657
	Therapeutic	8	25	32.000	18.551	-13.392	77.392
	Dental	0	2				
I211	<i>Percentage of facilities in which the provider used a clean barrier to protect fingers when opening a glass ampoule [YES answer]</i>						
	Vaccinations	29	44	65.909	2.828	58.989	72.829
	Therapeutic	12	24	50.000	10.704	23.807	76.193
	Dental	2	2				
I212	<i>Percentage of facilities in which temperature sensitive vaccines were kept between 2°C-8°C during the period of use [YES answer]</i>						
	Vaccinations	9	35	25.714	8.665	4.511	46.918

Table XI. Structured observations of other procedures (phlebotomy, lancet, intravenous injection and intravenous infusion) which may reflect risk to patients

Item No	Description	#	N	%	SE	95% CI	
						Lower Limit	Upper Limit
I303	<i>Percentage of facilities in which the procedures are prepared on a clean, dedicated table or tray where contamination of the equipment with blood, body fluids or dirty swabs is unlikely</i>						
	Phlebotomy	22	34	64.706	7.456	46.461	82.951
	Lancet	17	30	56.667	17.448	13.973	99.360
	IV Injection	18	32	56.250	10.716	30.030	82.470
	IV Infusion	21	39	53.846	6.628	37.627	70.065
I308	<i>Percentage of facilities for which before a procedure is done, skin at the puncture site is prepared using CHG 2%, povidone-iodine or alcohol before skin puncture</i>						
	Phlebotomy	27	35	77.143	9.621	53.601	100.685
	Lancet						
	IV Injection	10	21	47.619	18.498	2.356	92.882
	IV Infusion	26	40	65.000	13.232	32.624	97.376
I311	<i>Percentage of facilities in which for each procedure, the device used was taken from a sterile packet or fitted with caps</i>						
	Phlebotomy	34	35	97.143	3.085	89.595	104.691
	Lancet	26	30	86.667	6.643	70.411	102.922
	IV Injection	21	32	65.625	6.872	48.811	82.439
	IV Infusion	38	40	95.000	3.184	87.210	102.790
I309	<i>Percentage of facilities in which during IV procedures in which providers palpate the venipuncture site after skin preparation with antiseptic</i>						
	Phlebotomies	20	27	74.074	9.516	49.613	98.535
	IV Injections	1	9	11.111	9.362	-14.881	37.103
	IV Infusions	16	26	61.538	3.075	53.635	69.442
I312	<i>Proportion of facilities in which for each procedure performed on an IV system using a needle/syringe, the IV system accessed from an IV port.</i>						
	IV Injections	26	29	89.655	5.169	77.006	102.304
	IV Infusions	10	12	83.333	8.178	63.324	103.343
I314	<i>Percentage of facilities in which injection ports are cleansed with CHG 2%, povidone-iodine or alcohol before accessing the IV system</i>						
	IV Injections	21	31	67.742	3.288	59.695	75.788
	IV Infusions	3	16	18.750	12.763	-12.479	49.979

Table XII. Sterilization practices which may reflect risk to patients

Item No	Description	#	N	%	SE*	95%CI	
						Lower Limit	Upper Limit
I401	Percentage of facilities in which steam sterilization is used to sterilize devices used for injections, phlebotomies, lancet procedures or IV procedures	4	79	5.063	3.258	-2.909	13.036
I405**	Other sterilization methods	13	78	16.667	6.115	1.704	31.630
I406**	Any sterilizable needles and syringes outside of a sterilizer	5	39				
I407**	Boiling or another cleansing method is used	13	80	16.250	6.024	1.510	30.990
I408**	Attempts at cleaning or sterilizing disposable devices	4	74	5.405	3.038	-2.028	12.839

Table XIII. Interview of health provider which may reflect risk to patients

Item No	Description	#	N	%	SE	95% CI	
						Lower Limit	Upper Limit
I502	Percentage of facilities exclusively using sterile, single-use needles and syringes for injections	67	80	83.750	3.674	74.759	92.741
I503	Percentage of facilities exclusively using sterile, single-use phlebotomy needles, or sterile, single-use needles and syringes for phlebotomies	64	80	80.00	9.157	57.593	102.407
I504	Percentage of facilities exclusively using sterile, single-use needles and catheters during performance of IV infusions or other procedures accessing IV systems	64	80	80.00	9.354	57.111	102.889
I509	Percentage of facilities in which there were no stock-outs of puncture-resistant sharps containers during the entire last six months	24	80	30.0	5.401	16.785	43.215
I511	Percentage of facilities in which the provider interviewed had received at least three doses of Hepatitis B vaccine	49	80	61.250	8.556	40.315	82.185
I512	Percentage of facilities in which the provider interviewed did not experience	40	80	50.00	5.052	37.639	62.361

	any needle stick injury in the last six months						
I515	Percentage of facilities in which the provider interviewed had injection safety training available to them within the last two years in a lecture or workshop [yes]	21	80	26.250	7.196	8.642	43.858

Table XIV. Information from supervisors of health providers which may reflect risk to patients

Item No	Description	#	N	%	SE	95% CI	
						Lower Limit	Upper Limit
I601	Percentage of facilities surveyed in which the supervisor interviewed showed the data collector an “injection safety” policy or guidelines [Response 1. “Yes, and it was shown”]	2	80	2.500	2.571	-3.790	8.790
I602	Percentage of facilities surveyed in which the supervisor interviewed showed the data collector a “health care waste management” policy/guidelines or similar [Response 1. “Yes, and it was shown”]	3	80	3.750	3.856	-5.685	13.185
I608	Percentage of facilities surveyed in which the supervisor interviewed reported that NO injections are administered using sterilizable syringes and needles in their facilities.	72	80	90.000	4.270	79.553	100.447
I610	Percentage of facilities surveyed in NO stock-outs of standard disposable or safety syringes occurred during the last six months	34	76	44.737	6.500	28.832	60.642
I614	Percentage of facilities surveyed in which there were NO stock-outs of puncture-resistant sharps containers in the last six months	36	76	47.368	7.959	27.893	66.844
I619	Percentage of facilities surveyed in which a procedure for placing an emergency order for injection devices exists	64	80	80.000	6.614	63.815	96.185

The data in Table XV showing stocks of injection equipment reveal that among the government health facilities, stocking supplies for injection which would last for at least two weeks was not frequently observed. The table was constructed using the

information on the estimate of usage for the various areas of the hospital and actually counting the stocks at the supplies room at the time of the visit.

Only 6% or very few hospitals reported having auto-disable equipment to last for two weeks. Only 38% of the government facilities would have enough supplies of disposable syringes. Even frequently used phlebotomy equipment good for two weeks was only seen in 41% of the facilities. Only 24% of the facilities maintained stocks for intravenous infusion.

Table XV. Information on disposable equipment which may reflect risk to patients

Item No	Description	#	N	%	SE	95% CI	
						Lower Limit	Upper Limit
I701	Percentage of facilities in which there is enough auto-disable injection equipment for at least two weeks	4	65	6.154	2.311	0.499	11.809
I702	Percentage of facilities in which there is enough disposable and re-use prevention feature (safety syringes) injection equipment for at least two weeks	29	77	37.662	8.359	17.208	58.117
I703	Percentage of facilities in which there is enough disposable phlebotomy equipment for at least two weeks	31	75	41.333	9.761	17.450	65.217
I704	Percentage of facilities in which there is enough disposable IV catheters for at least two weeks	18	75	24.000	5.903	9.555	38.445
I705	Percentage of facilities in which there is enough disposable IV sets for at least two weeks	19	75	25.333	8.059	5.613	45.054

The following shows the distribution of the 80 main providers interviewed according to type: [Note other providers are present during the interview]

Table XVI. Types of health professionals who performed the observed procedures and interviewed, November to December 2007.

Q501	Frequency	Percent	Cumulative Percent
Nurse	73	91.3%	91.3%

Phlebotomist	3	3.8%	95.1%
Physician	3	3.8%	98.9%
Medical Technologist	1	1.3%	100.0%
Total	80	100.0%	100.0%

Table XVII: List of Other Providers Present during Procedures

Others Providers Present	Frequency
Nurse and Physician	1
Physician, Phlebotomist, Medical Technologist, Medical Student	1
Phlebotomist	4
Phlebotomist and Dentist	1
Dentist and Midwife	3
Phlebotomist and medical technologist	1
Dentists Aide	1
ER Midwife	1
Medical Technologist	7
Midwife	3
MT	2
Nursing Attendant	1
PGT	1

B: Assessment items reflecting risks to the provider

Injection risks to the health provider include mainly the transmission of blood-borne pathogens such as Hepatitis B, Hepatitis C and HIV mainly through accidental needle stick injury. The risks are inherent in all procedures which involve handling sharp medical equipment. Similarly though, best practices have been able to identify and guide health providers on ways to reduce risk of needle stick injury and its consequences.

Table XVIII. Structured Facility Observations which may indicate risk to the provider

Item No	Description	No	N	%	SE	Lower Limit	Upper Limit
I106	Percentage of facilities with NO non-sharps infectious waste of any type outside of containers specific for non-sharps infectious waste	11	80	13.75	4.803	1.997	25.503
I108	Percentage of facilities with NO overflowing or pierced sharps containers of any type in any area of the facility	45	80	56.25	7.891	36.942	75.558
I109	Percentage of facilities with NO used sharps containers in an open container in any area of the facility	18	80	22.50	5.422	9.234	35.766
I111	Percentage of facilities with at least one puncture resistant and leak proof sharps container in all areas where vaccinations are given	38	77	49.351	5.157	36.732	61.970
I112	Percentage of facilities with at least one puncture resistant and leak proof sharps container in all areas where therapeutic injections are given	36	79	45.57	4.587	34.344	56.795
I113	Percentage of facilities with at least one puncture resistant and leak proof sharps container in all areas where phlebotomies are performed [YES Answer]	51	74	68.919	3.103	61.327	76.511
I114	Percentage of facilities with at least one puncture resistant and leak proof sharps container in all areas where IV procedures performed [YES Answer]	51	77	66.234	5.554	52.643	79.825
I115	Percentage of facilities with one or more puncture-resistant safety container/s “in stock”	14	80	17.5	3.475	8.997	26.003

Another strategy to reduce injection risk is the prevention of needle stick injuries through clear hospital policies related to safe sharps handling and sharps disposal. In our survey, less than 5 supervisors of health providers were able to show the actual manuals of their own facility on injection safety and waste management (Table XXII, Item I601 and I602).

Best practices will tell us that all in order not to expose the health provider to any avoidable risk, in general any needles used during a procedure should be placed in a puncture-proof closed container immediately after use without recapping. In this survey, there were many observations made that documented noncompliance to this recommendation.

In Table XVIII, Items I111-I114, the presence of at least one puncture resistant container in the areas where the injection procedures were performed ranged from 49-69% only. Field observers have noted that in lieu of puncture resistant containers, some of the facilities had only boxes of paper or thin cardboard to put used sharps into. It is not common practice to keep puncture resistant containers in stock at the injection areas. Only 17.5% of the facilities were able to show additional puncture resistant containers in stock when asked (Table XVIII, Item I115). As a result, it was noted that almost half of the facilities observed had overflowing sharps containers.

Risk to Providers related to Injection Practices There were 60 vaccinations and 48 therapeutic injections observed. Table XIX and XX below summarizes details of the injection procedures and phlebotomy, lancet procedures and intravenous injections respectively, as observed based on the assessment tool.

The unsafe practice of two-handed recapping is still widely practiced in many health facilities. Only 30.00% (95%CI 10.262, 49.738) of the facilities was noted not to have recapping of needles after administration of vaccination.

Related to this, the immediate disposal of the used needle into a puncture-resistant container was only observed in 26.67 (95%CI 18.413, 34.920) of the vaccinations and only 8.333 (95%CI 1.255, 15.412) for therapeutic injections.

XIX. Injection Practices which may indicate increased risk to provider

Item No	Description	#	N	%	SE	95% CI	
						Lower Limit	Upper Limit
I216	Percentage of facilities in which there was an absence of recapping of needles after administering a vaccination	18	60	30.000	8.066	10.262	49.738
I216	Percentage of facilities in which there was an absence of two-handed recapping of needles after administering a therapeutic injection	14	48	29.167	6.655	12.882	45.451
I217	Percentage of facilities in which after vaccinations , the provider immediately disposed of the used needle/syringe in an appropriate sharps container	16	60	26.667	3.373	18.413	34.920
I217	Percentage of facilities in which after therapeutic injections , the provider immediately disposed of the used needle/syringe in an appropriate sharps container	4	48	8.333	2.893	1.255	15.412

Table XX below contain observations as follows: a total of 35 phlebotomies, 30 lancet procedures, 32 intravenous injections and 40 intravenous infusions were observed in 80 facilities.

Unlike vaccination and therapeutic injections which are mostly intramuscular and usually does not access the intravascular components, phlebotomies, lancet procedures, and intravenous injections and infusions actually aims to access the blood system either to draw a sample of blood or infuse sterile medications or fluids into the bloodstream. Because these procedures invade the vascular system of the patient and could potentially expose the health provider with blood, precautions to reduce risk

from such anticipated exposures should be in place. These include use of clean gloves during the procedure, properly securing the arm of the patient to reduce risk for injury, not recapping nor removing uncapped needles as well as transferring blood from one container to another, and prompt and proper disposal of the sharp and non sharp infectious waste soon after the procedure.

In this study it was noted that for the phlebotomy procedures observed in 35 facilities, glove use was infrequent with only 17% of the facilities documented their phlebotomists to be wearing new gloves during the procedure (Item I307). The practice of removing the uncapped needle from the adapter is still widely used in almost two-thirds of the facilities (Item I316). Two handed recapping was observed in almost three-fourths of the facilities (Item I317). The transferring of blood from syringe to vacuum tube using two hands was seen in more than 80% of facilities (Item I318).

Similar trends were seen for the intravenous infusion and injection procedures. The use of gloves was even lower with only 1 of 30 IV injections (3.33%) and 5 of 39 IV infusions documented to comply with the glove use recommendation. Recapping with two hands was done in 87% of the IV injection procedures (Table XIX Item I317).

Prompt disposal of both sharps and non-sharp infectious wastes after an injection reduces opportunity for accidental needle stick injuries and other similar exposures. For all the procedures, most of the sharp disposal rates immediately after the procedure into proper sharps disposal bins were at least 50% among those observed (Items I319): 75.7% for phlebotomies (95%CI, 61.3, 92.2), 60.0% for lancet

procedures (95%CI 45.7, 74.3), 50.0% for IV injections (95%CI 25.2, 74.8), and 82.1% for IV infusions (95%CI 66.8, 97.3).

Table XX. Structured observations of other procedures which may reflect risk to provider

Item No	Description	#	N	%	SE	95% CI	
						Lower Limit	Upper Limit
Phlebotomies							
I306	Percentage of facilities surveyed in which providers appropriately secured the patient and the intended puncture site so that the patient could not move during the procedure	34	35	97.143	3.085	89.595	104.691
I307	Percentage of facilities surveyed which phlebotomists wear a new pair of gloves for a phlebotomy	6	35	17.143	5.642	3.338	30.948
I316	Did the provider remove an uncapped needle from any device using only her/his hands? Percentage of facilities in which uncapped needles were NOT removed from phlebotomy holder/adapters using only hands	12	32	37.500	11.131	10.263	64.737
I317	Percentage of facilities surveyed in which NO two-handed recapping of any needles after performing phlebotomies occurred	9	34	26.471	5.414	13.222	39.719
I318	Percentage of facilities in which blood was NOT transferred from a syringe/needle directly into a vacuum tube using a two-handed techniques	5	27	18.519	7.811	-0.594	37.631
I319	Percentage of facilities surveyed in which, immediately after the procedure, the provider disposed of sharps in an appropriate sharps container	25	33	75.758	6.320	60.293	91.222
I320	Percentage of facilities in which immediately after the procedure, the provider disposed of non-sharps infectious waste in a container specific for non-sharps infectious waste	17	34	50.00	7.450	31.770	68.230
Lancet Procedures							
I306	Percentage of facilities surveyed in which providers appropriately secured the patient and the intended puncture site so that the patient could not move during	26	30	86.667	8.473	65.935	107.399

	the procedure						
I319	Percentage of facilities surveyed in which, immediately after the procedure, the provider disposed of sharps in an appropriate sharps container	18	30	60.00	5.850	45.686	74.314
I320	Percentage of facilities in which immediately after the procedure, the provider disposed of non-sharps infectious waste in a container specific for non-sharps infectious waste	16	30	53.333	8.161	33.364	73.302
Intravenous Injections and Infusions							
I306	Percentage of facilities surveyed in which providers appropriately secured the patient and the intended puncture site so that the patient could not move during the IV injection	29	32	90.625	4.943	78.530	102.720
I306	Percentage of facilities surveyed in which providers appropriately secured the patient and the intended puncture site so that the patient could not move during the IV infusion	36	40	90.00	7.522	71.594	108.406
I307	Percentage of facilities surveyed which provider wore a new pair of gloves for an IV injection	1	30	3.333	3.317	-4.784	11.450
I307	Percentage of facilities surveyed which the provider wore a new pair of gloves for an IV infusion	5	39	12.821	5.976	-1.803	27.444
I317	Percentage of facilities surveyed in which NO two-handed recapping of any needles after performing IV injections occurred	4	32	12.500	7.780	-6.537	31.537
I319	Percentage of facilities surveyed in which, immediately after the IV injection , the provider disposed of sharps in an appropriate sharps container	16	32	50.00	10.126	25.222	74.778
I319	Percentage of facilities surveyed in which, immediately after the IV infusion , the provider disposed of sharps in an appropriate sharps container	32	39	82.051	6.224	66.821	97.281
I320	Percentage of facilities in which immediately after the IV Injection procedure, the provider disposed of non-sharps infectious waste in a container specific for non-sharps infectious waste	14	32	43.750	8.061	24.026	63.474
I320	Percentage of facilities in which immediately after the IV infusion procedure, the provider disposed of non-sharps infectious waste in a container specific for non-sharps infectious waste	20	38	52.632	9.390	29.654	75.609

Immunization of health care workers against Hepatitis B is an excellent way to prevent acquiring the infection. Hepatitis B should be given for three doses. For healthcare workers, it is recommended to antibody levels of the anti-Hepatitis B s antibody at least 28 days after the third dose of the vaccine series to have the assurance of protection.

In the Philippines, several training institutions have made it mandatory to have Hepatitis B immunization during medical or nursing school and prior to employment. There are no existing national policies related to this.

The data in Table XXI shows that among the interviewed health providers giving the injections, only 61.2% had received three or more doses of the Hepatitis B vaccine (Item I510). Only 77.5 % of the interviewed has received at least one dose of the vaccine (Item I511).

Other important information from this table is the high frequency of needle stick injury that 50% of the interviewed providers admitted to (Item I512). It is also important to take note that not all needle stick injuries were reported (Item I513) with only 10 out of the 38 providers. Only in about one-fourth of the facilities did the providers recall having attended an injection safety training lecture or workshop in the last two years (Item I515).

The presence of manuals for waste management and injection safety program is not immediately available in the facilities visited. Only 2 of the 80 facilities were able to present written copy of the injection safety guideline when the supervisor was asked

(Item I601). Only 2 of the 80 facilities (Item I602) were able to show a waste management guideline.

Table XXI. Information from health providers and their supervisors which may reflect risk to providers

Interview with Providers							
Item No	Description	#	N	%	SE	95% CI	
						Lower Limit	Upper Limit
I509	Percentage of facilities surveyed in which NO stock-outs of puncture resistant sharps containers during the entire last six months	24	80	30.0	5.401	16.785	43.215
I510	Percentage of facilities surveyed in which providers have had at least one Hepatitis B vaccination	62	80	77.500	3.849	68.083	86.917
I511	Percentage of facilities surveyed in which providers have had 3 or more doses of Hepatitis B vaccination	49	80	61.250	8.556	40.315	82.185
I512	Percentage of facilities surveyed in which providers have had NO needle stick or sharps injuries in the last six months	40	80	50.00	5.052	37.639	62.361
I513	No. of Providers who reported the sustained needle stick injury	10	38				10 in 38 injuries reported the injury
I514	Percentage of facilities surveyed in which providers that reported sharps were asked whether they already had had three Hepatitis B vaccinations	7	10				7 in 10 reports of injuries, Hep B vaccination was asked
I515	Percentage of facilities in which the provider interviewed had injection safety training available to them within the last two years in a lecture or workshop [yes]	21	80	26.250	7.196	8.642	43.858
Interview of Supervisors of Providers							
I601	Percentage of facilities surveyed in which the supervisor interviewed showed the data collector an “injection safety” policy or guidelines	2	80	2.500	2.571	-3.790	8.790
I602	Percentage of facilities surveyed in which the supervisor interviewed showed the data collector a “health care waste management” policy/guidelines or similar	3	80	3.750	3.856	-5.685	13.185

I614	Percentage of facilities surveyed in which there were NO stock-outs of puncture-resistant sharps containers in the last six months	36	76	47.368	7.959	27.893	66.844
I618	Percentage of facilities surveyed in which staff that handle health care waste have access to 'heavy gloves	31	80	38.750	10.793	12.340	65.160
I618	Percentage of facilities surveyed in which there were NO needle stick/sharps injuries in the previous 6 months for staff that handle health care waste	41	80	51.250	9.148	28.866	73.634

C. Assessment items reflecting risk to the community

Some of the items in the questionnaire reflect risk to the general public. These mainly involve the assurance that sharps and all other non-sharp but infectious wastes from injection procedures are managed appropriately and should not become an unnecessary hazard any person inside and outside the health facilities. These wastes must be managed according to local and international health and environmental standards.

Table XXII summarizes these indicators suggesting risk to the community.

Table XXII. Structured facility observations which suggest risk to the community

Section 1. Facility Observations							
Item No	Description	N	N	%	SE	95% CI	
						Lower Limit	Upper Limit
I106	Percentage of facilities with NO non-sharps infectious waste of any type outside of containers specific for non-sharps infectious waste	11	80	13.75	4.803	1.997	25.503
I108	Percentage of facilities with NO overflowing or pierced sharps containers of any type in any area of the facility	45	80	56.25	7.891	36.942	75.558
I109	Percentage of facilities with NO used sharps containers in an open container in any area of the facility	18	80	22.50	5.422	9.234	35.766
I110	Percentage of facilities in	21	80	26.25	5.673	12.368	40.132

	which there were separate waste containers for infectious non-sharps waste in each injection area						
I120	Percentage of facilities in which all sharps containers awaiting final destruction were completely closed	42	80	52.50	8.337	32.101	72.899
I121	Percentage of facilities in which all sharps containers awaiting final destruction are stored in a locked area or otherwise stored safely away from public access	46	80	57.500	4.797	45.761	69.239
I122	Percentage of facilities in which there were NO used sharps on the ground or immediately outside the health facility and/or around the disposal site	72	80	90.00	3.819	80.656	99.344
I115	Percentage of facilities in which there was one or more puncture-resistant safety containers "in stock"	14	80	17.5	3.475	8.997	26.003
I123	Percentage of facilities in which the final disposal for sharps waste generated by the facility was by closed burning in a medium or high temperature incinerator/furnace, dumping in a secure pit or transport off-site for treatment	57	80	71.25	15.12	34.253	108.247
	3-Medium or HighTemp Incinerator/Furnace	0	80		Other Types		
	6-Dumping in a protected (secure) pit (including needle pit)	28	80		Type	Number	
	9-Transportation for off site treatment	36	80		2-Open burning in a hole or in enclosure	6	
					5-Burial	34	
					7-Dumping:unprotected	3	
					Others		
					Collected (Infectious Waste Management)	4	
					Landfill Collected	1	
Interview of the provider							
I515	Percentage of facilities in which the provider interviewed had injection safety training available to them within the last two years in a lecture	21	80	26.250	7.196	8.642	43.858

V. ANALYSIS AND DISCUSSION:

This is the first formal assessment to determine the country situation of the safety of injections, phlebotomies, lancet procedures and intravenous procedures among government health facilities. The results reported above reflect many areas of compliance to the international best injection practices as defined by the World Health Organization. On the other hand, this assessment report has likewise documented various practices in the Philippines which do not meet standard and require necessary action and improvement from individual practitioners, facilities and the national government to reduce risks of unsafe injections not only to patients but also to the health providers and the community in general.

Best practices in injection safety specifically tell us that in order not to harm the patients, each procedure should be administered with *a new sterile single-use device*, using the right medication, vaccine or fluid for infusion.² Similarly a new sterile single use device must be used for each reconstitution of each unit of medication. In many countries, this has become easily implementable because of the low international retail cost of the needle-syringe set available. A disposable hypodermic 2ml syringe with needle cost only 3 US cents each while 0.5ml auto-disable syringes cost 6 US cents.³

Unfortunately the low cost of injection equipment has been applicable in the Philippines. Until about two decades ago the practice of sterilizing for re-use both sterilizable and disposable needles and syringes was widely done in almost all government facilities in the Philippines to save on public hospital resources. Over the years, re-use of needles and syringes has been slowly but steadily being phased out.

Surprisingly, current day practice reflected in the results of the survey undertaken show that re-use of needles and syringes is actually low. It suggests that despite the relatively high unit cost of injection equipment, the understanding of the need for new sterile single use devices and perhaps the awareness of the risk of re-using needles is already widespread, and thus supply of new syringes and needles has become a priority.

Sterile single use injection devices available in the international market include: sterile hypodermic syringes with needles, auto-disable syringes for immunization, syringes with a reuse prevention feature, and syringes with needle stick prevention features. In this study, we have documented the availability only of sterile disposable hypodermic syringes with needles in the government facilities. Auto-disable syringes were seen only in rural health units giving immunization and the study team was told that these auto-disable syringes were supplied by the UNICEF. Other types of syringes with safety and needle stick prevention features are not yet available in the government facilities.

Assistance from a global health agency such as the World Health Organization in bringing down the cost of injection devices will allow facilities to be able to have enough supplies and stock for needs over a longer period of time.

While reuse of needles and syringes does not seem to be a major problem in the Philippine government health facilities, the availability and accessibility to safety, puncture resistant containers for prompt disposal of sharps after the procedure is the more pressing area of concern, posing definite risks to health providers and the

community. The data shows that many facilities across the country are lacking with supplies of a puncture-resistant container to allow prompt disposal of the sharp injection device after use. While innovations and resourcefulness are allowed even by the WHO, these safety disposal devices must still comply with the general requirements of being puncture resistant. Paper, cardboard, light plastic bottles used for drinking water do not suffice. Visit to barangay health centers would show that through the UNICEF, these centers are also supplied with the disposal boxes which are manufactured by a local distributor.

Other areas to improve the level of injection safety are clearly possible and feasible. One main area is improvement of infection control practices during performance of injection procedures including hand hygiene, preparation of medications or vaccine, use of gloves, disinfection of the site of injection, phlebotomy or intravenous insertion. The study shows low compliance to best practices of procedures. Avoidable risks for needle stick injury are easily observed in many facilities such as recapping, holding needles with bare hands, transferring blood. The widespread use of multidose vials with needles sticking onto the diaphragms for unknown periods of time can be easily be changed with training.

Based on the answers of providers and their supervisors, as well as during the feedback workshops, training on injection safety to increase awareness and improve injection practices have been infrequent in the past. Information dissemination through training workshops on an institutional level, provincial, regional or even national level could be planned and coordinated between the WHO, the DOH and the PHICS. The value of occupational health and feasible arrangements for 100%

coverage of hepatitis B immunization of health providers are immediate pressing concerns that could be also addressed.

The difficulty of almost all the facilities to show a manual on existing policies for injection safety and waste management is also revealing. It suggests a revisit of the national policies, implementing rules and regulations on injection safety and waste management and how the government can assist its public health facilities be aware and comply with the national and local standards and regulations. It may also herald an invitation for the development of guidelines and local “best practices” from the professional societies of infectious diseases and infection control to guide practicing health professionals to observe safer injection practices.

VI. CONCLUSIONS

The nationwide assessment of the safety of injections, phlebotomies, lancet procedures and intravenous injections and infusions using 80 randomly selected government health facilities by two-stage sampling to represent the government facilities of the Philippines has been completed. The most important findings are as follows:

- 1) The frequency of re-use of needles and evidence for attempts to sterilize used needles was low (less than 16%). This is also supported by the actual observations that injection devices were obtained by opening new sterile packets of new syringes and needles during the various procedures observed, seen in 80% or more of the procedures;

- 2) High frequency of noncompliance to best injection safety practices are widespread in the government facilities including hand hygiene before injection procedure, preparing the injection medication, vaccine or fluid in an adequately clean place, proper disinfection of skin site, use of gloves in procedures that invade the vascular system, palpation of the skin site after disinfection, and use of multidose vials with needles left neglected onto the diaphragms;
- 3) High frequency of high risk practices prone to needle stick injuries such as removing the uncapped needle from the adapter widely used in almost two-thirds of the facilities, two handed recapping was observed in almost three-fourths of the facilities, and the transferring of blood from syringe to vacuum tube using two hands was seen in more than 80% of facilities;
- 4) Many facilities lacked adequate sharp disposal systems with only 49-69% of health facilities documented to have at least one through a puncture-resistant container in designated areas where procedures were routinely performed for prompt and safe disposal immediately after each procedure. Only 17.5% of the facilities had additional puncture resistant containers in stock when asked and in more than half of the facilities were overflowing sharps containers seen;
- 5) Incomplete protection for hepatitis B through vaccination of health care providers with only 61.2% admitting to having had received three or more doses of the Hepatitis B vaccine, and 77.5% at least one dose of the vaccine; 50% of health providers admitting to high frequency of needle stick injuries that not all needle stick injuries were reported with only 10 out of the 38 providers reporting; and only in about one-fourth of the facilities did the providers recall having attended an injection safety training lecture or workshop in the last two years;

6) Almost all facilities were unable to show a manual of injection safety or a manual of waste management.

Other important information derived from the study beyond the scope of the WHO assessment tool C-revised are the following: 1) The cost of injection devices in Philippines is higher than that reported in international retail and this cost is transferred to the patients whenever the health facilities are unable to meet the supply-demand requirements; 2) Health facilities welcome training and information related to injection safety and health waste management.; 3) Introduction of technology-driven advances in injection devices with safety features is an area that should be explored.

The critical components that would greatly improve the current situation of injection safety in the Philippine government health facilities would include: 1) Leadership and guidance from the Department of Health to define national standards and set and implement applicable regulations; 2) Access to affordable safe injection devices, preferably with safety features; 3) Continuing training and information dissemination on best practices; 3) Support of the healthcare workforce through Hepatitis B immunization and provision of protective equipment (gloves, hand hygiene facilities).

VII. RECOMMENDATIONS.

Based on the study findings, it is recommended that the Philippine national program for injection safety be strengthened with the strategies addressing the areas that were identified in this study as areas of concern:

- Training on infection control on safer injections including hand hygiene, single use devices, proper use of multidose vials, preparation of injection medication, use of gloves as needed and proper disposal of sharps and non sharps waste after injection procedure
- Increase awareness through training on risk reduction of needle stick injury by not recapping
- Availability of supplies of injection devices particularly recent advances in technology of syringes allowing auto-disable and other safety devices.
- Reducing retail cost of injection devices on a country level
- Availability of supplies for puncture-resistant disposal containers in all areas within all facilities performing injection procedures
- Increase coverage of protection of health providers by hepatitis B immunization
- Strengthening implementing rules and regulations on proper waste management and injection safety at local and national level to comply with international standards

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